CLAIMS

1. A compound semiconductor light-emitting diode comprising a light-emitting layer composed of a Group III-V compound semiconductor, and a current diffusion layer provided on the light-emitting layer and composed of a Group III-V compound semiconductor, characterized in that the current diffusion layer is composed of a conductive boron-phosphide-based semiconductor and has a bandgap at room temperature wider than that of the light-emitting layer.

2. A compound semiconductor light-emitting diode according to claim 1, wherein the current diffusion layer is composed of at least one species selected from among
boron monophosphide,
boron gallium indium phosphide represented by a compositional formula $B_\alpha Ga_\gamma In_{1-\alpha-\gamma}P$ ($0 < \alpha \leq 1$, $0 \leq \gamma < 1$),
boron nitride phosphide represented by a compositional formula $BP_{1-\delta}N_\delta$ ($0 \leq \delta < 1$), and
boron arsenide phosphide represented by a compositional formula $B_\alpha P_{1-\delta}As_\delta$.

3. A compound semiconductor light-emitting diode according to claim 1, wherein the difference between the bandgap at room temperature of the current diffusion layer and the bandgap at room temperature of the light-emitting layer accounts for 0.1 eV or more.

4. A compound semiconductor light-emitting diode according to claim 1, wherein the current diffusion layer has a bandgap at room temperature of 2.8 eV to 5.0 eV.

5. A compound semiconductor light-emitting diode according to claim 1, wherein the current diffusion layer has a carrier concentration at room temperature of 1×10^{19} cm^{-3} or more, a resistivity at room temperature of 5×10^{-2} $\Omega \cdot cm$ or less, and a thickness of 50 nm to 5,000 nm.

6. A compound semiconductor light-emitting diode according to claim 1, wherein the diode includes, between the current diffusion layer and the light-emitting layer, a cladding layer composed of a Group III-V compound semiconductor, and the cladding layer has a bandgap at room temperature wider than that of the light-emitting layer and equal to or narrower than that of the current diffusion layer.

7. A compound semiconductor light-emitting diode according to claim 6, wherein the cladding layer is composed of a Group III-V compound semiconductor containing aluminum, gallium, and indium, and the current diffusion layer is composed of a boron-phosphide-based semiconductor containing at least one species selected from among aluminum, gallium, and indium.

8. A compound semiconductor light-emitting diode according

to claim 6 or claim 7, wherein the diode includes a composition-graded layer having a compositional gradient and being composed of a boron-phosphide-based semiconductor, and the composition-graded layer serves as the current diffusion layer and the cladding layer.

9. A compound semiconductor light-emitting diode according to claim 1, wherein the light-emitting layer is composed of an aluminum gallium indium phosphide mixed crystal represented by a compositional formula $Al_XGa_YIn_ZP$ ($0 \leq X, Y, Z \leq 1$, $X + Y + Z = 1$), and at least one of the current diffusion layer and the cladding layer are composed of an undoped boron-phosphide-based semiconductor to which no impurity element has been intentionally added.

10. A compound semiconductor light-emitting diode according to claim 1, wherein an Ohmic contact electrode is joined to the current diffusion layer or the composition-graded layer.